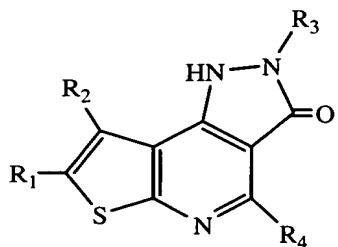


IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A compound of formula I



(I)

wherein

R₁ and R₂ are each independently H, C₁-C₁₀alkyl optionally substituted with one or more halogen, hydroxy, C₁-C₄alkoxy, CO₂R₆, CONR₇R₈, C₃-C₇cycloalkyl or optionally substituted phenyl groups, or

phenyl optionally substituted with one to three halogen, hydroxy, C₁-C₆haloalkyl, C₁-C₄alkoxy, CO₂R₉, NR₁₀R₁₁ or CN groups;

R₃ is H, C₁-C₆alkyl optionally substituted with a phenyl, naphthyl or C₅-C₁₀ heteroaryl ring system containing 1, 2 or 3 heteroatoms selected from N, O or S group each group optionally substituted with one to three C₁-C₆alkyl, C₁-C₆haloalkyl, C₁-C₄alkoxy, hydroxy, CHO, NO₂, CN, CO₂R₁₂ or NR₁₃R₁₄ groups,

phenyl optionally substituted with one to three halogen, NO₂, CN, hydroxy, C₁-C₆alkyl, C₁-C₆haloalkyl, C₁-C₆alkoxy, phenyl, phenoxy, benzyl, benzyloxy, CONR₁₅R₁₆, SO₂NR₁₅R₁₆, CO₂R₁₇, NR₁₈R₁₉ or CH₂CO₂R₂₀ groups, naphthyl optionally substituted with one to three halogen, NO₂, CN, hydroxy, C₁-C₆alkyl, C₁-C₆haloalkyl, C₁-C₆alkoxy, phenyl, phenoxy, benzyl, benzyloxy, CO₂R₁₇, NR₁₈R₁₉ or CH₂CO₂R₂₀ groups,

C₅-C₇cycloheteroalkyl ring system containing 1 or 2 heteroatoms selected from N, O or S optionally containing one double bond and optionally substituted with

one to three halogen, NO₂, CN, C₁-C₆alkyl, C₁-C₆haloalkyl, C₁-C₄alkoxy, CO₂R₁₇ or NR₁₈R₁₉ groups, or

C₅-C₁₀ heteroaryl ring system containing 1, 2 or 3 heteroatoms selected from N, O or S optionally substituted with one to three halogen, NO₂, CN, C₁-C₆alkyl, C₁-C₆haloalkyl, C₁-C₄alkoxy, CO₂R₁₇ or NR₁₈R₁₉ groups;

R₄ is phenyl optionally substituted with one to three halogen, NO₂, CN, hydroxy, C₁-C₆alkyl, C₁-C₆alkylthio, C₁-C₆haloalkyl, C₁-C₆alkoxy, phenyl, phenoxy, benzyl, benzyloxy, SO_nR₂₆, SO₂NR₂₁R₂₂, CO₂R₂₃ or NR₂₄R₂₅ groups,

C₅-C₇ cycloheteroalkyl ring system containing 1 or 2 heteroatoms selected from N, O or S optionally containing one double bond and optionally substituted with one or more halogen, NO₂, CN, hydroxy, C₁-C₆alkyl, C₁-C₆alkylthio, C₁-C₆haloalkyl, C₁-C₆alkoxy, phenyl, phenoxy, benzyl, benzyloxy, SO_nR₂₆, SO₂NR₂₁R₂₂, CO₂R₂₃ or NR₂₄R₂₅ groups, or

C₅-C₁₀ heteroaryl ring system containing 1, 2 or 3 heteroatoms selected from N, O or S optionally substituted with one or more halogen, NO₂, CN, hydroxy, C₁-C₆alkyl, C₁-C₆alkylthio, C₁-C₆haloalkyl, C₁-C₆alkoxy, phenyl, phenoxy, benzyl, benzyloxy, SO_nR₂₆, SO₂NR₂₁R₂₂, CO₂R₂₃ or NR₂₄R₂₅ groups;

R₅ is H, C₁-C₃alkyl or haloalkyl;

R₆, R₉, R₁₂, R₁₇, R₂₀, R₂₆ and R₂₇ are each independently H or a C₁-C₆alkyl, C₃-C₇cycloalkyl, C₁-C₆haloalkyl, phenyl, C₅-C₇cycloheteroalkyl ring system containing 1 or 2 heteroatoms selected from N, O or S optionally containing one double bond or C₅-C₁₀ heteroaryl ring system containing 1, 2 or 3 heteroatoms selected from N, O or S group each optionally substituted;

n is 0 or an integer of 1 or 2;

R₇, R₈, R₁₀, R₁₁, R₁₃, R₁₄, R₁₈, R₁₉, R₂₁, R₂₂, R₂₄ and R₂₅ are each independently H or a C₁-C₆alkyl, C₃-C₇cycloalkyl, C₁-C₆haloalkyl, phenyl, C₅-C₇cycloheteroalkyl ring system containing 1 or 2 heteroatoms selected from N, O or S optionally containing one double bond or C₅-C₁₀ heteroaryl ring system containing 1, 2 or 3 heteroatoms selected from N, O or S group each optionally substituted or each of R₇ and R₈ or R₁₀ and R₁₁ or R₁₃ and R₁₄ or R₁₈ and R₁₉ or R₂₁ and R₂₂ or R₂₄ and R₂₅ may be taken together with the nitrogen atom to which they are attached to form a 5- to 7-membered ring optionally containing another heteroatom selected from O, N or S; and

R₁₅ and R₁₆ are each independently H, NH₂, CH₂CH₂OCH₂CH₂OCH₂CH₂NH₂ or a C₁-C₆alkyl group optionally substituted with one or two CN, OR₅, NR₁₃R₁₄, CO₂R₁₇ or C₃-C₇cycloalkyl group;

phenyl optionally substituted with one or two halogen, OR_5 , CN, $NR_{13}R_{14}$, CO_2R_{17} , COR_{27} , an optionally substituted C_1 - C_8 alkyl group or an optionally substituted C_2 - C_6 alkenyl group;

benzyl optionally substituted with one or two halogen, OR_5 , COR_{27} or a C_1 - C_6 alkyl group optionally substituted with one OR_5 or

pyridinyl optionally substituted with one or two halogen, OR_5 , $NR_{13}R_{14}$ or CO_2R_{17} groups or

R_{15} and R_{16} may be taken together with the atom to which they are attached to form an optionally substituted 5- to 7-membered ring optionally containing one double bond, a benzofused ring or an additional heteroatom selected from O, N or S; or

~~the stereoisomers thereof or the pharmaceutically acceptable salts thereof.~~

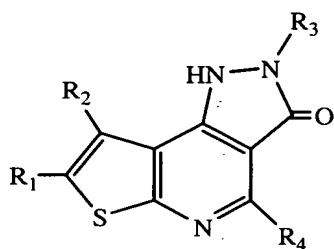
2. (Original) The compound according to claim 1 wherein R_3 is an optionally substituted phenyl or heteroaryl group.
3. (Original) The compound according to claim 1 wherein R_1 and R_2 are H.
4. (Original) The compound according to claim 1 wherein R_4 is a C_5 - C_7 cycloheteroalkyl, heteroaryl or phenyl group each optionally substituted with one or two halogen, CN, NO_2 , CF_3 , methoxy, carboxy or SOR_{26} groups.
5. (Original) The compound according to claim 2 wherein R_1 and R_2 are H.
6. (Original) The compound according to claim 2 wherein R_4 is a thienyl, pyridyl or phenyl group, each optionally substituted with one or two halogen, CN, NO_2 , CF_3 , methoxy, carboxy or $SOCH_3$ groups.
7. (Original) The compound according to claim 3 wherein R_3 is a phenyl group substituted with one or two halogen, $CONR_{15}R_{16}$ or $SO_2NR_{15}R_{16}$ groups.
8. (Original) The compound according to claim 7 wherein R_4 is a phenyl group substituted with one NO_2 or CF_3 group.
9. (Currently Amended) The compound according to claim 1 selected from the group consisting of:

2-(4-chlorophenyl)-4-[3-(trifluoromethyl)phenyl]-1,2-dihydro-3H-pyrazolo-[3,4-d]thieno[2,3-b]pyridin-3-one;

2-(4-fluorophenyl)-4-[3-(trifluoromethyl)phenyl]-1,2-dihydro-3H-pyrazolo-[3,4-d]thieno[2,3-b]pyridin-3-one;

N-(3,4-dihydroxybenzyl)-3-{3-oxo-4-[3-(trifluoromethyl)phenyl]-3,6-dihdropyrazolo[3,4-d]thieno[2,3-b]pyridin-2(1H)-yl}benzamide;
N-[3-(1-hydroxyethyl)phenyl]-4-{3-oxo-4-[3-(trifluoromethyl)phenyl]-3,6-dihdropyrazolo[3,4-d]thieno[2,3-b]pyridin-2(1H)-yl}benzamide;
({[4-(6-methyl-3-oxo-4-[3-(trifluoromethyl)phenyl]-dihdropyrazolo-[3,4-d]thieno[2,3-b]pyridin-2(1H)-yl]phenyl}sulfonyl)amino)acetic acid;
the stereoisomers thereof; or and the pharmaceutically acceptable salts thereof.

10. (Currently Amended) A method for the treatment of an immune disorder related to or affected by the immune regulatory protein B7-1 which comprises providing a patient in need thereof an immunotherapeutically effective amount of a compound of formula I



(I)

wherein

R₁ and R₂ are each independently H, C₁-C₁₀alkyl optionally substituted with one or more halogen, hydroxy, C₁-C₄alkoxy, CO₂R₆, CONR₇R₈, C₃-C₇cycloalkyl or optionally substituted phenyl groups, or phenyl optionally substituted with one to three halogen, hydroxy, C₁-C₆haloalkyl, C₁-C₄alkoxy, CO₂R₉, NR₁₀R₁₁ or CN groups;

R₃ is H, C₁-C₆alkyl optionally substituted with a phenyl, naphthyl or C₅-C₁₀ heteroaryl ring system containing 1, 2 or 3 heteroatoms selected from N, O or S group each group optionally substituted with one to three C₁-C₆alkyl, C₁-C₆haloalkyl, C₁-C₄alkoxy, hydroxy, CHO, NO₂, CN, CO₂R₁₂ or NR₁₃R₁₄ groups,

phenyl optionally substituted with one to three halogen, NO₂, CN, hydroxy, C₁-C₆alkyl, C₁-C₆haloalkyl, C₁-C₆alkoxy, phenyl, phenoxy, benzyl, benzyloxy, CONR₁₅R₁₆, SO₂NR₁₅R₁₆, CO₂R₁₇, NR₁₈R₁₉ or CH₂CO₂R₂₀ groups, naphthyl optionally substituted with one to three halogen, NO₂, CN, hydroxy, C₁-C₆alkyl, C₁-C₆haloalkyl, C₁-C₆alkoxy, phenyl, phenoxy, benzyl, benzyloxy, CO₂R₁₇, NR₁₈R₁₉ or CH₂CO₂R₂₀ groups,

C₅-C₇cycloheteroalkyl ring system containing 1 or 2 heteroatoms selected from N, O or S optionally containing one double bond and optionally substituted with one to three halogen, NO₂, CN, C₁-C₆alkyl, C₁-C₆haloalkyl, C₁-C₄alkoxy, CO₂R₁₇ or NR₁₈R₁₉ groups, or

C₅-C₁₀ heteroaryl ring system containing 1, 2 or 3 heteroatoms selected from N, O or S optionally substituted with one to three halogen, NO₂, CN, C₁-C₆alkyl, C₁-C₆haloalkyl, C₁-C₄alkoxy, CO₂R₁₇ or NR₁₈R₁₉ groups;

R₄ is phenyl optionally substituted with one to three halogen, NO₂, CN, hydroxy, C₁-C₆alkyl, C₁-C₆alkylthio, C₁-C₆haloalkyl, C₁-C₆alkoxy, phenyl, phenoxy, benzyl, benzyloxy, SO_nR₂₆, SO₂NR₂₁R₂₂, CO₂R₂₃ or NR₂₄R₂₅ groups, cycloheteroalkyl ring system containing 1 or 2 heteroatoms selected from N, O or S optionally containing one double bond and optionally substituted with one or more halogen, NO₂, CN, hydroxy, C₁-C₆alkyl, C₁-C₆alkylthio, C₁-C₆haloalkyl, C₁-C₆alkoxy, phenyl, phenoxy, benzyl, benzyloxy, SO_nR₂₆, SO₂NR₂₁R₂₂, CO₂R₂₃ or NR₂₄R₂₅ groups, or

C₅-C₁₀ heteroaryl ring system containing 1, 2 or 3 heteroatoms selected from N, O or S optionally substituted with one or more halogen, NO₂, CN, hydroxy, C₁-C₆alkyl, C₁-C₆alkylthio, C₁-C₆haloalkyl, C₁-C₆alkoxy, phenyl, phenoxy, benzyl, benzyloxy, SO_nR₂₆, SO₂NR₂₁R₂₂, CO₂R₂₃ or NR₂₄R₂₅ groups;

R₅ is H, C₁-C₃alkyl or haloalkyl;

R₆, R₉, R₁₂, R₁₇, R₂₀, R₂₆ and R₂₇ are each independently H or a C₁-C₆alkyl, C₃-C₇cycloalkyl, C₁-C₆haloalkyl, phenyl, C₅-C₇cycloheteroalkyl ring system containing 1 or 2 heteroatoms selected from N, O or S optionally containing one double bond or C₅-C₁₀ heteroaryl ring system containing 1, 2 or 3 heteroatoms selected from N, O or S group each optionally substituted;

n is 0 or an integer of 1 or 2;

R₇, R₈, R₁₀, R₁₁, R₁₃, R₁₄, R₁₈, R₁₉, R₂₁, R₂₂, R₂₄ and R₂₅ are each independently H or a C₁-C₆alkyl, C₃-C₇cycloalkyl, C₁-C₆haloalkyl, phenyl, C₅-C₇cycloheteroalkyl ring system containing 1 or 2 heteroatoms selected from N, O or S optionally containing one double bond or C₅-C₁₀ heteroaryl ring system containing 1, 2 or 3 heteroatoms selected from N, O or S group each optionally substituted or each of R₇ and R₈ or R₁₀ and R₁₁ or R₁₃ and R₁₄ or R₁₈ and R₁₉ or R₂₁ and R₂₂ or R₂₄ and R₂₅ may be taken together with the nitrogen atom to which they are attached to form a 5- to 7-membered ring optionally containing another heteroatom selected from O, N or S; and

R₁₅ and R₁₆ are each independently H, NH₂, CH₂CH₂OCH₂CH₂OCH₂CH₂NH₂ or a C₁-C₆alkyl group optionally substituted with one or two CN, OR₅, NR₁₃R₁₄, CO₂R₁₇ or C₃-C₇cycloalkyl group;

phenyl optionally substituted with one or two halogen, OR₅, CN, NR₁₃R₁₄, CO₂R₁₇, COR₂₇, an optionally substituted C₁-C₆alkyl group or an optionally substituted C₂-C₆alkenyl group;

benzyl optionally substituted with one or two halogen, OR₅, COR₂₇ or a C₁-C₆alkyl group optionally substituted with one OR₅ or

pyridinyl optionally substituted with one or two halogen, OR₅, NR₁₃R₁₄ or CO₂R₁₇ groups or

R₁₅ and R₁₆ may be taken together with the atom to which they are attached to form an optionally substituted 5- to 7-membered ring optionally containing one double bond, a benzofused ring or an additional heteroatom selected from O, N or S; or

~~the stereoisomers thereof or the pharmaceutically acceptable salts thereof.~~

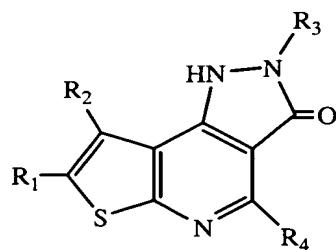
11. (Original) The method according to claim 10 wherein said disorder is transplant rejection.

12. (Original) The method according to claim 10 wherein said disorder is an autoimmune disease.

13. (Original) The method according to claim 10 wherein said disorder is graft vs. host disease.

14. (Original) The method according to claim 12 wherein said disease is multiple sclerosis or rheumatoid arthritis.

15. (Currently Amended) A pharmaceutical composition which comprises a pharmaceutically acceptable carrier and an effective amount of a compound of formula I



(I)

wherein

R₁ and R₂ are each independently H, C₁-C₁₀alkyl optionally substituted with one or more halogen, hydroxy, C₁-C₄alkoxy, CO₂R₆, CONR₇R₈, C₃-C₇cycloalkyl or optionally substituted phenyl groups, or

phenyl optionally substituted with one to three halogen, hydroxy, C₁-C₆haloalkyl, C₁-C₄alkoxy, CO₂R₉, NR₁₀R₁₁ or CN groups;

R₃ is H, C₁-C₆alkyl optionally substituted with a phenyl, naphthyl or C₅-C₁₀ heteroaryl ring system containing 1, 2 or 3 heteroatoms selected from N, O or S group each group optionally substituted with one to three C₁-C₆alkyl, C₁-C₆haloalkyl, C₁-C₄alkoxy, hydroxy, CHO, NO₂, CN, CO₂R₁₂ or NR₁₃R₁₄ groups,

phenyl optionally substituted with one to three halogen, NO₂, CN, hydroxy, C₁-C₆alkyl, C₁-C₆haloalkyl, C₁-C₆alkoxy, phenyl, phenoxy, benzyl, benzyloxy, CONR₁₅R₁₆, SO₂NR₁₅R₁₆, CO₂R₁₇, NR₁₈R₁₉ or CH₂CO₂R₂₀ groups,

naphthyl optionally substituted with one to three halogen, NO₂, CN, hydroxy, C₁-C₆alkyl, C₁-C₆haloalkyl, C₁-C₆alkoxy, phenyl, phenoxy, benzyl, benzyloxy, CO₂R₁₇, NR₁₈R₁₉ or CH₂CO₂R₂₀ groups,

C₅-C₇cycloheteroalkyl ring system containing 1 or 2 heteroatoms selected from N, O or S optionally containing one double bond and optionally substituted with one to three halogen, NO₂, CN, C₁-C₆alkyl, C₁-C₆haloalkyl, C₁-C₄alkoxy, CO₂R₁₇ or NR₁₈R₁₉ groups, or

C₅-C₁₀ heteroaryl ring system containing 1, 2 or 3 heteroatoms selected from N, O or S optionally substituted with one to three halogen, NO₂, CN, C₁-C₆alkyl, C₁-C₆haloalkyl, C₁-C₄alkoxy, CO₂R₁₇ or NR₁₈R₁₉ groups;

R₄ is phenyl optionally substituted with one to three halogen, NO₂, CN, hydroxy, C₁-C₆alkyl, C₁-C₆alkylthio, C₁-C₆haloalkyl, C₁-C₆alkoxy, phenyl, phenoxy, benzyl, benzyloxy, SO_nR₂₆, SO₂NR₂₁R₂₂, CO₂R₂₃ or NR₂₄R₂₅ groups,

C₅-C₇cycloheteroalkyl ring system containing 1 or 2 heteroatoms selected from N, O or S optionally containing one double bond and optionally substituted with one or more halogen, NO₂, CN, hydroxy, C₁-C₆alkyl, C₁-C₆alkylthio, C₁-C₆haloalkyl, C₁-C₆alkoxy, phenyl, phenoxy, benzyl, benzyloxy, SO_nR₂₆, SO₂NR₂₁R₂₂, CO₂R₂₃ or NR₂₄R₂₅ groups, or

C₅-C₁₀ heteroaryl ring system containing 1, 2 or 3 heteroatoms selected from N, O or S optionally substituted with one or more halogen, NO₂, CN, hydroxy, C₁-C₆alkyl, C₁-C₆alkylthio, C₁-C₆haloalkyl, C₁-C₆alkoxy, phenyl, phenoxy, benzyl, benzyloxy, SO_nR₂₆, SO₂NR₂₁R₂₂, CO₂R₂₃ or NR₂₄R₂₅ groups;

R₅ is H, C₁-C₃alkyl or haloalkyl;

R₆, R₉, R₁₂, R₁₇, R₂₀, R₂₆ and R₂₇ are each independently H or a C₁-C₆alkyl, C₃-C₇cycloalkyl, C₁-C₆haloalkyl, phenyl, C₅-C₇cycloheteroalkyl ring system containing 1

or 2 heteroatoms selected from N, O or S optionally containing one double bond or C₅-C₁₀ heteroaryl ring system containing 1, 2 or 3 heteroatoms selected from N, O or S group each optionally substituted;

n is 0 or an integer of 1 or 2;

R₇, R₈, R₁₀, R₁₁, R₁₃, R₁₄, R₁₈, R₁₉, R₂₁, R₂₂, R₂₄ and R₂₅ are each independently H or a C₁-C₆alkyl, C₃-C₇cycloalkyl, C₁-C₆haloalkyl, phenyl, C₅-C₇cycloheteroalkyl ring system containing 1 or 2 heteroatoms selected from N, O or S optionally containing one double bond or C₅-C₁₀ heteroaryl ring system containing 1, 2 or 3 heteroatoms selected from N, O or S group each optionally substituted or each of R₇ and R₈ or R₁₀ and R₁₁ or R₁₃ and R₁₄ or R₁₈ and R₁₉ or R₂₁ and R₂₂ or R₂₄ and R₂₅ may be taken together with the nitrogen atom to which they are attached to form a 5- to 7-membered ring optionally containing another heteroatom selected from O, N or S; and

R₁₅ and R₁₆ are each independently H, NH₂, CH₂CH₂OCH₂CH₂OCH₂CH₂NH₂ or a C₁-C₆alkyl group optionally substituted with one or two CN, OR₅,

NR₁₃R₁₄, CO₂R₁₇ or C₃-C₇cycloalkyl group;

phenyl optionally substituted with one or two halogen, OR₅, CN, NR₁₃R₁₄, CO₂R₁₇, COR₂₇, an optionally substituted C₁-C₆alkyl group or an optionally substituted C₂-C₆alkenyl group;

benzyl optionally substituted with one or two halogen, OR₅, COR₂₇ or a C₁-C₆alkyl group optionally substituted with one OR₅ or pyridinyl optionally substituted with one or two halogen, OR₅, NR₁₃R₁₄ or CO₂R₁₇ groups or

R₁₅ and R₁₆ may be taken together with the atom to which they are attached to form an optionally substituted 5- to 7-membered ring optionally containing one double bond, a benzofused ring or an additional heteroatom selected from O, N or S; or

the stereoisomers thereof or the pharmaceutically acceptable salts thereof.

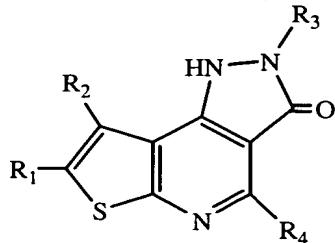
16. (Original) The composition according to claim 15 having a formula I compound wherein R₃ is an optionally substituted phenyl, thienyl or pyridyl group.

17. (Original) The composition according to claim 16 having a formula I compound wherein R₁ and R₂ are H.

18. (Original) The composition according to claim 17 having a formula I compound wherein R₄ is a thienyl, pyridyl or phenyl group each optionally substituted with one or two halogen, CN, NO₂, CF₃, methoxy, carboxy or SOCH₃ groups.

19. (Original) The composition according to claim 18 having a formula I compound wherein R_3 is a phenyl group substituted with one or two halogen, $CONR_{15}R_{16}$ or $SO_2NR_{15}R_{16}$ groups.

20. (Currently Amended) A process for the preparation of a compound of formula I



(I)

wherein

R_1 and R_2 are each independently H, C_1-C_{10} alkyl optionally substituted with one or more halogen, hydroxy, C_1-C_4 alkoxy, CO_2R_6 , $CONR_7R_8$, C_3-C_7 cycloalkyl or optionally substituted phenyl groups, or phenyl optionally substituted with one to three halogen, hydroxy, C_1-C_6 haloalkyl, C_1-C_4 alkoxy, CO_2R_9 , $NR_{10}R_{11}$ or CN groups;

R_3 is H, C_1-C_6 alkyl optionally substituted with a phenyl, naphthyl or C_5-C_{10} heteroaryl ring system containing 1, 2 or 3 heteroatoms selected from N, O or S group each group optionally substituted with one to three C_1-C_6 alkyl, C_1-C_6 haloalkyl, C_1-C_4 alkoxy, hydroxy, CHO, NO_2 , CN, CO_2R_{12} or $NR_{13}R_{14}$ groups,

phenyl optionally substituted with one to three halogen, NO_2 , CN, hydroxy, C_1-C_6 alkyl, C_1-C_6 haloalkyl, C_1-C_6 alkoxy, phenyl, phenoxy, benzyl, benzyloxy, $CONR_{15}R_{16}$, $SO_2NR_{15}R_{16}$, CO_2R_{17} , $NR_{18}R_{19}$ or $CH_2CO_2R_{20}$ groups,

naphthyl optionally substituted with one to three halogen, NO_2 , CN, hydroxy, C_1-C_6 alkyl, C_1-C_6 haloalkyl, C_1-C_6 alkoxy, phenyl, phenoxy, benzyl, benzyloxy, CO_2R_{17} , $NR_{18}R_{19}$ or $CH_2CO_2R_{20}$ groups,

C_5-C_7 cycloheteroalkyl ring system containing 1 or 2 heteroatoms selected from N, O or S optionally containing one double bond and optionally substituted with one to three halogen, NO_2 , CN, C_1-C_6 alkyl, C_1-C_6 haloalkyl, C_1-C_4 alkoxy, CO_2R_{17} or $NR_{18}R_{19}$ groups, or

C₅-C₁₀ heteroaryl ring system containing 1, 2 or 3 heteroatoms selected from N, O or S optionally substituted with one to three halogen, NO₂, CN, C₁-C₆alkyl, C₁-C₆haloalkyl, C₁-C₄alkoxy, CO₂R₁₇ or NR₁₈R₁₉ groups;

R₄ is phenyl optionally substituted with one to three halogen, NO₂, CN, hydroxy, C₁-C₆alkyl, C₁-C₆alkylthio, C₁-C₆haloalkyl, C₁-C₆alkoxy, phenyl, phenoxy, benzyl, benzyloxy, SO_nR₂₆, SO₂NR₂₁R₂₂, CO₂R₂₃ or NR₂₄R₂₅ groups,

C₅-C₇cycloheteroalkyl ring system containing 1 or 2 heteroatoms selected from N, O or S optionally containing one double bond and optionally substituted with one or more halogen, NO₂, CN, hydroxy, C₁-C₆alkyl, C₁-C₆alkylthio, C₁-C₆haloalkyl, C₁-C₆alkoxy, phenyl, phenoxy, benzyl, benzyloxy, SO_nR₂₆, SO₂NR₂₁R₂₂, CO₂R₂₃ or NR₂₄R₂₅ groups, or

C₅-C₁₀ heteroaryl ring system containing 1, 2 or 3 heteroatoms selected from N, O or S optionally substituted with one or more halogen, NO₂, CN, hydroxy, C₁-C₆alkyl, C₁-C₆alkylthio, C₁-C₆haloalkyl, C₁-C₆alkoxy, phenyl, phenoxy, benzyl, benzyloxy, SO_nR₂₆, SO₂NR₂₁R₂₂, CO₂R₂₃ or NR₂₄R₂₅ groups;

R₅ is H, C₁-C₃alkyl or haloalkyl;

R₆, R₉, R₁₂, R₁₇, R₂₀, R₂₆ and R₂₇ are each independently H or a C₁-C₆alkyl, C₃-C₇cycloalkyl, C₁-C₆haloalkyl, phenyl, C₅-C₇cycloheteroalkyl ring system containing 1 or 2 heteroatoms selected from N, O or S optionally containing one double bond or C₅-C₁₀ heteroaryl ring system containing 1, 2 or 3 heteroatoms selected from N, O or S group each optionally substituted;

n is 0 or an integer of 1 or 2;

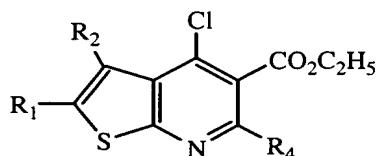
R₇, R₈, R₁₀, R₁₁, R₁₃, R₁₄, R₁₈, R₁₉, R₂₁, R₂₂, R₂₄ and R₂₅ are each independently H or a C₁-C₆alkyl, C₃-C₇cycloalkyl, C₁-C₆haloalkyl, phenyl, C₅-C₇cycloheteroalkyl ring system containing 1 or 2 heteroatoms selected from N, O or S optionally containing one double bond or C₅-C₁₀ heteroaryl ring system containing 1, 2 or 3 heteroatoms selected from N, O or S group each optionally substituted or each of R₇ and R₈ or R₁₀ and R₁₁ or R₁₃ and R₁₄ or R₁₈ and R₁₉ or R₂₁ and R₂₂ or R₂₄ and R₂₅ may be taken together with the nitrogen atom to which they are attached to form a 5- to 7-membered ring optionally containing another heteroatom selected from O, N or S; and

R₁₅ and R₁₆ are each independently H, NH₂, CH₂CH₂OCH₂CH₂OCH₂CH₂NH₂ or a C₁-C₆alkyl group optionally substituted with one or two CN, OR₅, NR₁₃R₁₄, CO₂R₁₇ or C₃-C₇cycloalkyl group;

phenyl optionally substituted with one or two halogen, OR₅, CN, NR₁₃R₁₄, CO₂R₁₇, COR₂₇, an optionally substituted C₁-C₈alkyl group or an optionally substituted C₂-C₆alkenyl group;

benzyl optionally substituted with one or two halogen, OR₅, COR₂₇ or a

C_1 - C_6 alkyl group optionally substituted with one OR_5 or
pyridinyl optionally substituted with one or two halogen, OR_5 , $NR_{13}R_{14}$ or
 CO_2R_{17} groups or
 R_{15} and R_{16} may be taken together with the atom to which they are
attached to form an optionally substituted 5- to 7-membered ring optionally
containing one double bond, a benzofused ring or an additional heteroatom
selected from O, N or S; or
which process comprises reacting a compound of formula VI



(VI)

wherein R_1 , R_2 and R_4 are described hereinabove with a hydrazine, R_3NHNH_2 , to give a 3-hydrazinylthieno-[2,3-b]pyridine intermediate; and cyclizing said intermediate to give the desired compound of formula I.